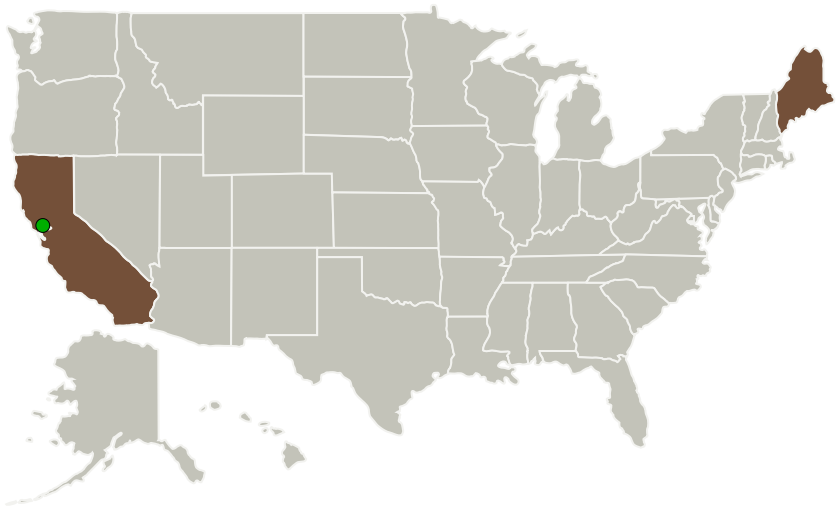
Integrated Composite Structure for EDL Application, Phase I

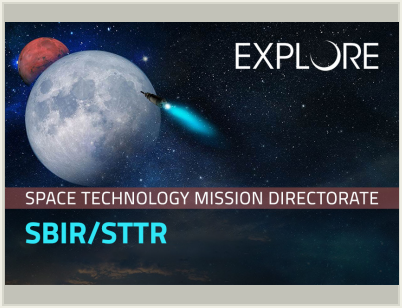
Completed Technology Project (2011 - 2011)

Project Introduction

NASA has defined a need for higher performance ablative Thermal Protection System (TPS) materials for future exploration of our solar system's inner and outer planets than is currently available. Of particular interest are: 1) Materials with performance analogous to fully dense, heritage rayon-based carbon phenolic ; 2) Mid-density ablative systems ; and 3) Highly insulative, low-density materials. New Frontiers, Mars Sample Return (MSR), and Mars Entry, Descent & Landing (Mars EDL) are all potential missions for these new and/or enhanced TPS materials, but the general desire is that these TPS be tunable for cross-cutting mission applications. In addition to improved TPS performance, NASA would benefit from a TPS integrated with the sub-structure thereby improving thermal efficiency, insulation performance, system thermal-structural performance, and system integrity with the goal of achieving increased system reliability, reduced areal mass, and/or decreased costs over the current state-of-the-art (SOTA).FMI proposes developing its multi-layered, graded, hybrid ICS system for application to NASA missions. The system is comprised of distinct material layers encompassing different fillers or reinforcements, but maintaining the same resin so the materials are compatible for co-curing to yield a continuous rigid heatshield and sub-structure (ICS).

Primary U.S. Work Locations and Key Partners





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Organizations Performing Work	Role	Type	Location
Fiber Materials, Inc.	Lead Organization	Industry	Biddeford, Maine
Ames Research Center(ARC)	Supporting Organization	NASA Center	Moffett Field, California

Primary U.S. Work Locations	
California	Maine

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/138672)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Fiber Materials, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

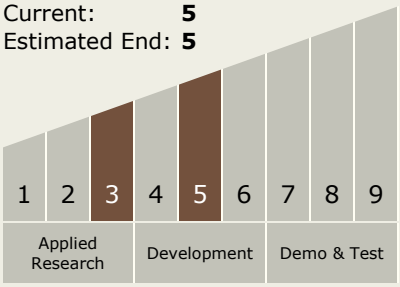
Carlos Torrez

Principal Investigator:

Paul K Martin

Technology Maturity (TRL)

Start: **3**
Current: **5**
Estimated End: **5**



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Technology Areas

Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - TX12.2 Structures
    - TX12.2.1 Lightweight Concepts

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System